CIGWELD Professional

300 AC/DC

TRANSTIG®

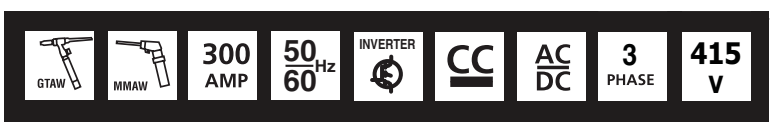
INVERTER ARC WELDER

Operating Manual

Revision: AC **Issue Date:** January 16, 2008 **Manual No.:** 0-4958

Operating Features:

CE



WE APPRECIATE YOUR BUSINESS!

Congratulations on your new Cigweld product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network. To locate your nearest distributor or service agency call +61-3-9474-7400, or visit us on the web at **www.cigweld.com.au.**

This Operating Manual has been designed to instruct you on the correct use and operation of your CIGWELD product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

YOU ARE IN GOOD COMPANY!

The Brand of Choice for Contractors and Fabricators Worldwide.

CIGWELD is a Global Brand of Arc Welding Products for Thermadyne Industries Inc. We manufacture and supply to major welding industry sectors worldwide including; Manufacturing, Construction, Mining, Automotive, Aerospace, Engineering, Rural and DIY/Hobbyist.

We distinguish ourselves from our competition through market-leading, dependable products that have stood the test of time. We pride ourselves on technical innovation, competitive prices, excellent delivery, superior customer service and technical support, together with excellence in sales and marketing expertise.

Above all, we are committed to develop technologically advanced products to achieve a safer working environment for industry operators.

WARNINGS

Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment.

While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use.

Transtig 300 AC/DC Inverter Arc Welder
Operating Manual Number 0-4958 for:
Part Number 700723

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Publication Date: January 16, 2008
Revision AC Date: September 22, 2008

Record the following information for Warranty purposes:

Where Purchased: _____

Purchase Date: _____

Equipment Serial #: _____

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SECTION 1:
ARC WELDING SAFETY INSTRUCTIONS AND WARNINGS

WARNING

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR. DO NOT LOSE THESE INSTRUCTIONS. READ OPERATING/INSTRUCTION MANUAL BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

Welding products and welding processes can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.

Safe practices have developed from past experience in the use of welding and cutting. These practices must be learned through study and training before using this equipment. Some of these practices apply to equipment connected to power lines; other practices apply to engine driven equipment. Anyone not having extensive training in welding and cutting practices should not attempt to weld.

Safe practices are outlined in the Australian Standard AS1674.2-2007 entitled: Safety in welding and allied processes Part 2: Electrical. This publication and other guides to what you should learn before operating this equipment are listed at the end of these safety precautions. **HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.**

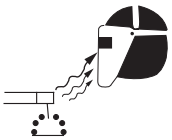
1.01 Arc Welding Hazards

WARNING

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lock input power disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. Turn off all equipment when not in use. Disconnect power to equipment if it will be left unattended or out of service.
7. Use fully insulated electrode holders. Never dip holder in water to cool it or lay it down on the ground or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.
8. Do not use worn, damaged, undersized, or poorly spliced cables.
9. Do not wrap cables around your body.
10. Ground the workpiece to a good electrical (earth) ground.
11. Do not touch electrode while in contact with the work (ground) circuit.
12. Use only well-maintained equipment. Repair or replace damaged parts at once.
13. In confined spaces or damp locations, do not use a welder with AC output unless it is equipped with a voltage reducer. Use equipment with DC output.
14. Wear a safety harness to prevent falling if working above floor level.
15. Keep all panels and covers securely in place.



WARNING

ARC RAYS can burn eyes and skin; NOISE can damage hearing.

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

1. Wear a welding helmet fitted with a proper shade of filter (see ANSI Z49.1 listed in Safety Standards) to protect your face and eyes when welding or watching.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.

WARNING

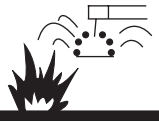
FUMES AND GASES can be hazardous to your health.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breath the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

Eye protection filter shade selector for welding or cutting (goggles or helmet), from AWS A 8.2-73

Welding or Cutting operation	Electrode size Metal Thickness or Welding Current	Filter shade no.	Welding or Cutting operation	Electrode size Metal Thickness or Welding Current	Filter shade no.
Torch soldering	All	2	Gas metal arc welding		
Torch brazing	All	2 or 3	Non Ferrous base metal	All	11
Oxygen cutting			Ferrous base metal	All	12
Light	Under 1 in., 25 mm	3 or 4	Gas tungsten arc welding (TIG)	All	12
Medium	1 – 6 in., 25 – 150 mm	4 or 5	Atomic Hydrogen welding	All	12
Heavy	Over 6 in., 150 mm	5 or 6	Carbon Arc welding	All	12
Gas welding			Plasma arc Welding	All	12
Light	Under 1/8 in., 3 mm	4 or 5	Carbon Arc Gouging		
Medium	1/8 – 1/2 in., 3 – 12 mm	5 or 6	Light		12
Heavy	Over 1/2 in., 12 mm	6 or 8	Heavy		14
Shielded metal-arc welding (stick) electrodes			Plasma arc cutting		
	Under 5/32 in., 4 mm	10	Light	Under 300 Amp	9
	Under 5/32 to ¼ in., 4 to 6.4mm	12	Medium	300 to 400 Amp	12
	Over ¼ in., 6.4 mm	14	Heavy	Over 400 Amp	14



WARNING

WELDING can cause fire or explosion.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.

WARNING

FLYING SPARKS AND HOT METAL can cause injury.

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.

WARNING

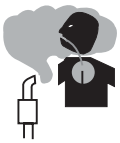
CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

WARNING

Engines can be dangerous.



WARNING

ENGINE EXHAUST GASES can kill.

Engines produce harmful exhaust gases.

1. Use equipment outside in open, well-ventilated areas.
2. If used in a closed area, vent engine exhaust outside and away from any building air intakes.

WARNING

ENGINE FUEL can cause fire or explosion.

Engine fuel is highly flammable.

1. Stop engine before checking or adding fuel.
2. Do not add fuel while smoking or if unit is near any sparks or open flames.
3. Allow engine to cool before fueling. If possible, check and add fuel to cold engine before beginning job.
4. Do not overfill tank — allow room for fuel to expand.
5. Do not spill fuel. If fuel is spilled, clean up before starting engine.

WARNING

MOVING PARTS can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.

WARNING

SPARKS can cause BATTERY GASES TO EXPLODE; BATTERY ACID can burn eyes and skin.

Batteries contain acid and generate explosive gases.

1. Always wear a face shield when working on a battery.
2. Stop engine before disconnecting or connecting battery cables.
3. Do not allow tools to cause sparks when working on a battery.
4. Do not use welder to charge batteries or jump start vehicles.
5. Observe correct polarity (+ and –) on batteries.

WARNING

STEAM AND PRESSURIZED HOT COOLANT can burn face, eyes, and skin.

The coolant in the radiator can be very hot and under pressure.

1. Do not remove radiator cap when engine is hot. Allow engine to cool.
2. Wear gloves and put a rag over cap area when removing cap.
3. Allow pressure to escape before completely removing cap.

WARNING

This product, when used for welding or cutting, produces fumes or gases which contain chemicals know to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety code Sec. 25249.5 et seq.)

NOTE

Considerations About Welding And The Effects of Low Frequency Electric and Magnetic Fields

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, Biological Effects of Power Frequency Electric & Magnetic Fields - Background Paper, OTA-BP-E-63 (Washington, DC: U.S. Government Printing Office, May 1989): "...there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields and interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures.

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cable around the body.
4. Keep welding power source and cables as far away from body as practical.

ABOUT PACEMAKERS:

The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

1.02 PRINCIPAL SAFETY STANDARDS

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices for Occupation and Educational Eye and Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safety in welding and allied processes Part 2: Electrical, AS1674.2-2007 from SAI Global Limited, www.saiglobal.com

1.03 DECLARATION OF CONFORMITY

Manufacturer: CIGWELD
Address: 71 Gower St, Preston
Victoria 3072

Australia

Description of equipment: Welding Equipment (GMAW, MMAW, GTAW). Including, but not limited to CIGWELD Transtig 200 Pi, Transtig 200 AC/DC, Transarc 300 Si, Transtig 300 Pi, Transtig 300 AC/DC, Transmig 400 i and associated accessories.

Serial numbers are unique with each individual piece of equipment and details description, parts used to manufacture a unit and date of manufacture.

The equipment conforms to all applicable aspects and regulations of the 'Low Voltage Directive' (Directive 73/23/EU, as recently changed in Directive 93/68/EU and to the National legislation for the enforcement of the Directive.

National Standard and Technical Specifications

The product is designed and manufactured to a number of standards and technical requirements among them are:

- AS/NZS 3652-(EMC Directive EN50199) applicable to arc welding equipment - generic emissions and regulations.
- EN60974-1 applicable to welding equipment and associated accessories.
- AS60974.1 applicable to welding equipment and associated accessories.

Extensive product design verification is conducted at the manufacturing facility as part of the routine design and manufacturing process, to ensure the product is safe and performs as specified. Rigorous testing is incorporated into the manufacturing process to ensure the manufactured product meets or exceeds all design specifications.

CIGWELD has been manufacturing and merchandising an extensive equipment range with superior performance, ultra safe operation and world class quality for more than 30 years and will continue to achieve excellence.

SECTION 2: INTRODUCTION

2.01 How To Use This Manual

This Owner's Manual applies to just specification or part numbers listed on page i.

To ensure safe operation, read the entire manual, including the chapter on safety instructions and warnings.

Throughout this manual, the words **WARNING, CAUTION**, and **NOTE** may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:

WARNING

A WARNING gives information regarding possible personal injury.

CAUTION

A CAUTION refers to possible equipment damage.

NOTE

A NOTE offers helpful information concerning certain operating procedures.

Additional copies of this manual may be purchased by contacting Cigweld at the address and phone number in your region listed in the inside rear cover. Include the Owner's Manual number and equipment identification numbers.

Electronic copies of this manual can also be downloaded at no charge in Acrobat PDF format by going to the Cigweld web site listed below and clicking on the Literature Library link:

http://www.cigweld.au.com

2.02 Equipment Identification

The unit's identification number (specification or part number), model, and serial number usually appear on a nameplate attached to the control panel. In some cases, the nameplate may be attached to the rear panel. Equipment which does not have a control panel such as gun and cable assemblies is identified only by the specification or part number printed on the shipping container. Record these numbers on the bottom of page i for future reference.

2.03 Receipt Of Equipment

When you receive the equipment, check it against the invoice to make sure it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to the location in your area listed in the inside back cover of this manual.

Include all equipment identification numbers as described above along with a full description of the parts in error.

Move the equipment to the installation site before uncrating the unit. Use care to avoid damaging the equipment when using bars, hammers, etc., to uncrate the unit.

2.04 Symbol Chart

Note that only some of these symbols will appear on your model.

	On
	Off
	Dangerous Voltage
	Increase/Decrease
	Circuit Breaker
	AC Auxiliary Power
	Fuse
A	Amperage
V	Voltage
Hz	Hertz (cycles/sec)
f	Frequency
	Negative
	Positive
	Direct Current (DC)
	Protective Earth (Ground)
	Line
	Line Connection
	Auxiliary Power
115V 15A	Receptacle Rating- Auxiliary Power

1 ~	Single Phase
3 ~	Three Phase
	Three Phase Static Frequency Converter-Transformer-Rectifier
	Remote
X	Duty Cycle
%	Percentage
	Panel/Local
	Shielded Metal Arc Welding (SMAW)
	Gas Metal Arc Welding (GMAW)
	Gas Tungsten Arc Welding (GTAW)
	Air Carbon Arc Cutting (CAC-A)
	Constant Current
	Constant Voltage Or Constant Potential
	High Temperature
	Fault Indication
	Arc Force
	Touch Start (GTAW)
	Variable Inductance
V	Voltage Input

	Wire Feed Function
	Wire Feed Towards Workpiece With Output Voltage Off.
	Welding Gun
	Purging Of Gas
	Continuous Weld Mode
	Spot Weld Mode
t	Spot Time
t1	Preflow Time
t2	Postflow Time
	2 Step Trigger Operation Press to initiate wirefeed and welding, release to stop.
	4 Step Trigger Operation Press and hold for preflow, release to start arc. Press to stop arc, and hold for preflow.
t	Burnback Time
	Disturbance In Ground System
IPM	Inches Per Minute
MPM	Meters Per Minute

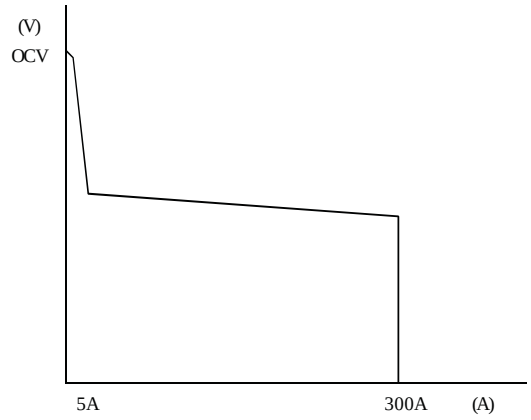
Art # A-04130

2.05 Description

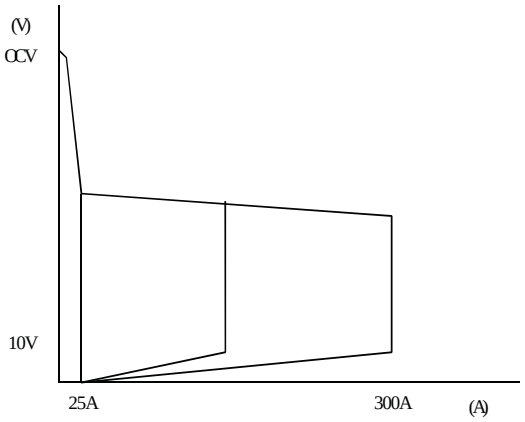
The Cigweld Transtig 300 AC/DC is a self contained three-phase AC/DC arc welding power source with Constant Current (CC) output characteristics. This unit is equipped with a Digital Volt/Amperage Meter, gas control valve, built in Sloper and Pulser, lift arc starter, and high-frequency arc starter for use with Gas Tungsten Arc Welding (GTAW), Gas Tungsten Arc Welding-Pulsed (GTAW-P) Gas Tungsten Arc Welding-Sloped (GTAW-S), and Shielded Metal Arc Welding (SMAW) processes. The power source is totally enclosed in an impact resistant, flame retardant and non-conductive plastic case.

NOTE

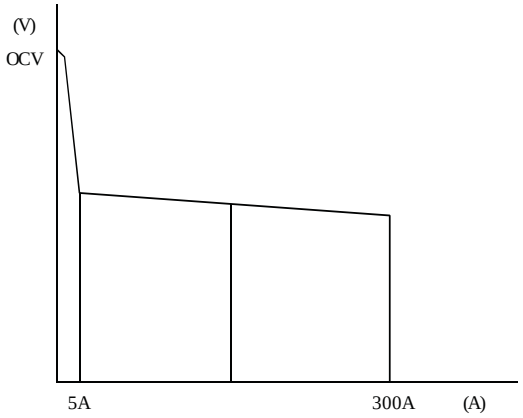
Volt-Ampere curves show the maximum Voltage and Amperage output capabilities of the welding power source. Curves of other settings will fall between the curves shown.



STICK Process



Lift TIG Process



HF TIG Process

Figure 2-1: Model 300 AC/DC Volt-Ampere curve

2.06 Functional Block Diagrams

Figure 2-2 illustrates the functional block diagram of the Transtig 300 AC/DC power source.

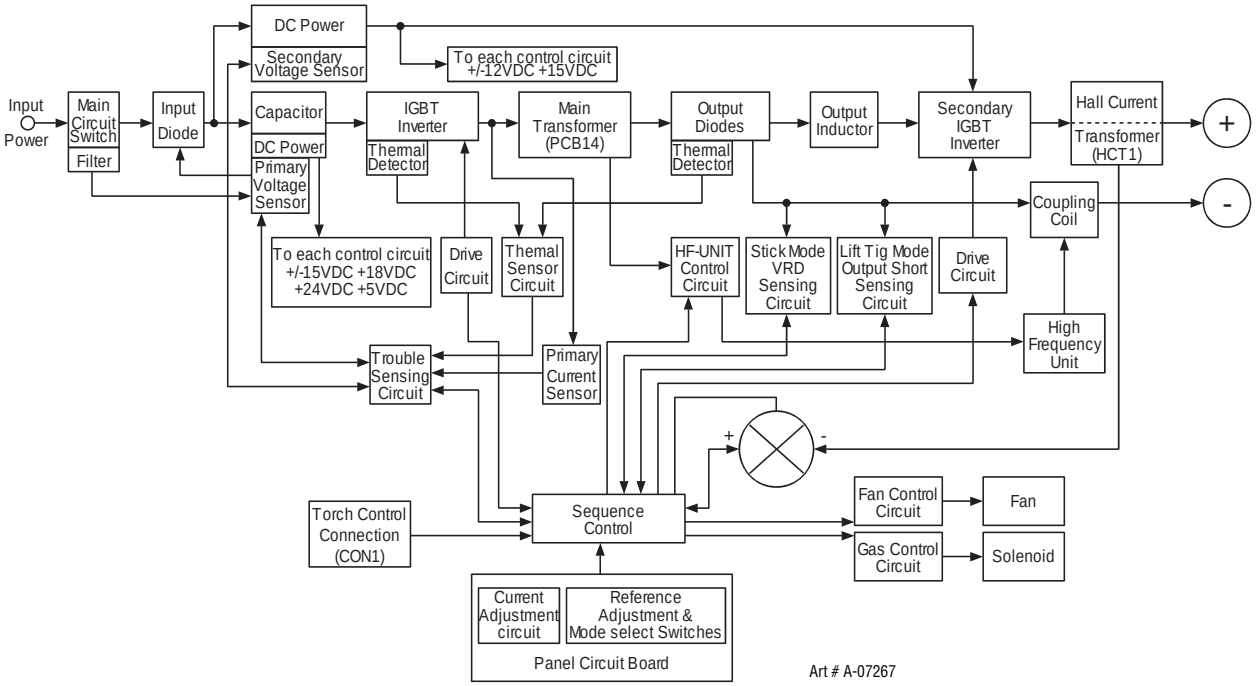


Figure 2-2: Transtig 300 AC/DC Model Functional Block Diagram

2.07 Transporting Methods

This unit is equipped with a handle for carrying purposes.

WARNING

ELECTRIC SHOCK can kill. DO NOT TOUCH live electrical parts. Disconnect input power conductors from de-energized supply line before moving the welding power source.

WARNING

FALLING EQUIPMENT can cause serious personal injury and equipment damage.

- Lift unit with handle on top of case.
- Use handcart or similar device of adequate capacity.
- If using a fork lift vehicle, place and secure unit on a proper skid before transporting.

2.08 Specifications

Parameter	Transtig 300AC/DC
Power Source Part Number	700723
Cooling	Fan Cooled
Welder Type	Inverter Power Source
Welding Power Source Mass	24kg
Dimensions	H 420mm x W 210mm x D 450mm
Maunfactured to Australian Standard	AS 60974.1-2006
Number of Phases	3
Nominal Supply Voltage	415V ±15%
Nominal Supply Frequency	50Hz
Open Circuit Voltage	65V
Welding Current Range	5 - 300 Amps
Effective Input Current (I1eff)	11.1 Amps
Maximum Input Current (I1max)	22.3 Amps
Three Phase Generator Requirement	16 KVA
Welding Output, 40°C, 10 min. (quoted figures refer to MMAW output)	300A @ 25%, 32.0V 190A @ 60%, 27.6V 150A @ 100%, 26.0V
Welding Output 40°C, 10 min. (Quoted figures refer to GTAW output)	300A @ 25%, 22.0V 190A @ 60%, 17.6V 150A @ 100%, 16.0V
Protection Class	IP23S

Cigweld continuously strives to produce the best product possible and therefore reserves the right to change, improve or revise the specifications or design of this or any product without prior notice. Such updates or changes do not entitle the buyer of equipment previously sold or shipped to the corresponding changes, updates, improvements or replacement of such items.

The values specified in the table above are optimal values, your values may differ. Individual equipment may differ from the above specifications due to in part, but not exclusively, to any one or more of the following; variations or changes in manufactured components, installation location and conditions and local power grid supply conditions.

SECTION 3: INSTALLATION

3.01 Environment

The Transtig 300 AC/DC is designed for use in hazardous environments. Examples of environments with increased hazardous environments are:

a. In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts;

b. In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator, or

c. In wet or damp hot locations where humidity or perspiration considerably reduces the skin resistance of the human body and the insulation properties of accessories.

Environments with hazardous environments do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

3.02 Location

Be sure to locate the welder according to the following guidelines:

- In areas, free from moisture and dust.
- Ambient temperature between 0 degrees C to 40 degrees C.
- In areas, free from oil, steam and corrosive gases.
- In areas, not subjected to abnormal vibration or shock.
- In areas, not exposed to direct sunlight or rain.
- Place at a distance of 12” (304.79mm) or more from walls or similar that could restrict natural airflow for cooling.

WARNING

Cigweld advises that this equipment be electrically connected by a qualified electrician.

3.03 Electrical Input Connections

WARNING

ELECTRIC SHOCK can kill; SIGNIFICANT DC VOLTAGE is present after removal of input power.

DO NOT TOUCH live electrical parts.

SHUT DOWN welding power source, disconnect input power employing lockout/tagging procedures. Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

3.04 Mains Supply Voltage Requirements

The Mains supply voltage should be within ± 15% of the rated Mains supply voltage. Too low a voltage may cause the fuse or circuit breaker to rupture due to the increased primary current. Too high a supply voltage will cause the Power Source to fail.

415V Mains Current Circuit Requirements for the Transtig 300 AC/DC

The Welding Power Source must be:

- Correctly installed, if necessary, by a qualified electrician.
- Correctly earthed (electrically) in accordance with local regulations.
- Connected to the correct size 415V Mains Current Circuit as per the Specifications

WARNING

CIGWELD advises that this equipment be electrically connected by a qualified electrical tradesperson.

The following 415V Mains Current Circuit recommendations are required to obtain the maximum welding current and duty cycle from this welding equipment:

Model	Minimum 415V Mains Current Circuit Size
Transtig 300 AC/DC	22.3 Amps

Table 3-1: 415V Mains Current Circuit Size To Acheive Maximum Current

3.05 High Frequency Introduction

The importance of correct installation of high frequency welding equipment cannot be overemphasized. Interference due to high frequency initiated or stabilized arc is almost invariably traced to improper installation. The following information is intended as a guide for personnel installing high frequency welding machines.

WARNING: EXPLOSIVES

The high frequency section of this machine has an output similar to a radio transmitter. The machine should NOT be used in the vicinity of blasting operations due to the danger of premature firing.

WARNING: COMPUTERS

It is also possible that operation close to computer installations may cause computer malfunction.

3.06 High Frequency Interference

Interference may be transmitted by a high frequency initiated or stabilized arc welding machine in the following ways:

1. **Direct Radiation:** Radiation from the machine can occur if the case is metal and is not properly grounded. It can occur through apertures such as open access panels. The shielding of the high frequency unit in the Power Source will prevent direct radiation if the equipment is properly grounded.
2. **Transmission via the Supply Lead:** Without adequate shielding and filtering, high frequency energy may be fed to the wiring within the installation (mains) by direct coupling. The energy is then transmitted by both radiation and conduction. Adequate shielding and filtering is provided in the Power Source.
3. **Radiation from Welding Leads:** Radiated interference from welding leads, although pronounced in the vicinity of the leads, diminishes rapidly with distance. Keeping leads as short as possible will minimize this type of interference. Looping and suspending of leads should be avoided where possible.
4. **Re-radiation from Unearthed Metallic Objects:** A major factor contributing to interference is re-radiation from unearthed metallic objects close to the welding leads. Effective grounding of such objects will prevent re-radiation in most cases.

3.07 Duty Cycle

The duty cycle of a welding power source is the percentage of a ten (10) minute period that it can be operated at a given output without causing overheating and damage to the unit. If the welding amperes decrease, the duty cycle increases. If the welding amperes are increased beyond the rated output, the duty cycle will decrease.

WARNING

Exceeding the duty cycle ratings will cause the thermal overload protection circuit to become energized and shut down the output until the unit has cooled to normal operating temperature.

CAUTION

Continually exceeding the duty cycle ratings can cause damage to the welding power source and will void the manufactures warranty.

NOTE

Due to variations that can occur in manufactured products, claimed performance, voltages, ratings, all capacities, measurements, dimensions and weights quoted are approximate only. Achievable capacities and ratings in use and operation will depend upon correct installation, use, applications, maintenance and service.

SECTION 4:
OPERATOR CONTROLS

4.01 Transtig 300 AC/DC Controls

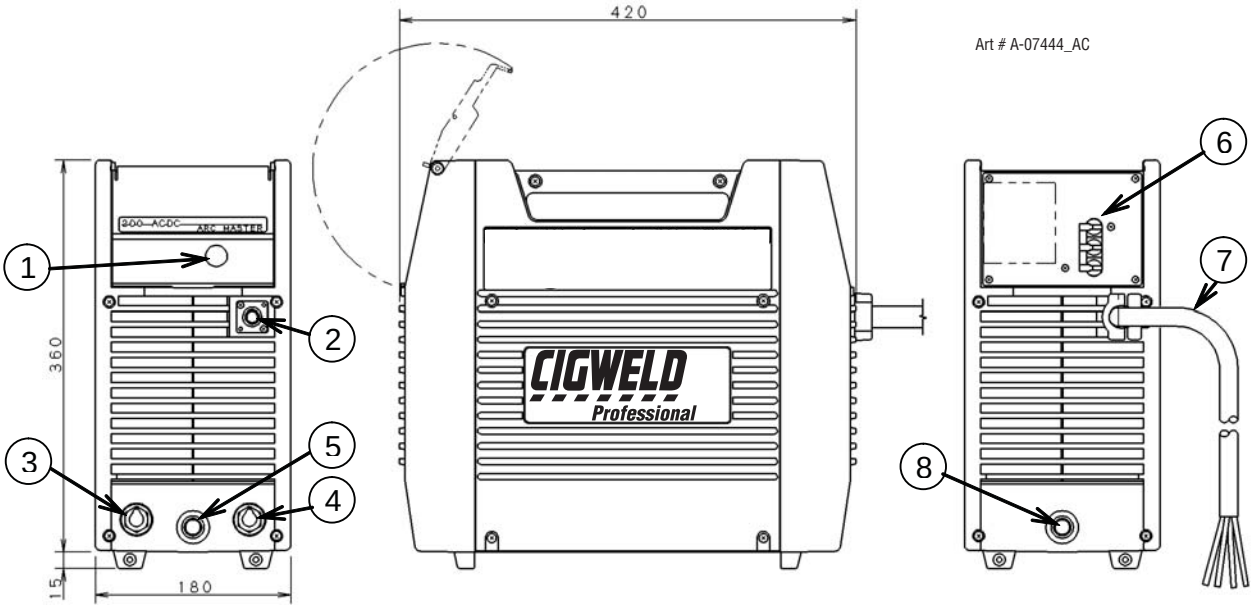


Figure 4-1: Transtig 300 AC/DC Power Source

1. **Control Knob:** This control sets the selected weld parameter, rotating it clockwise increases the parameter that is indicated on the digital meter. Pushing the knob inward displays the actual welding voltage.

2. **Remote Control Socket:** The 14 pin Remote Control Socket is used to connect remote current control devices to the welding Power Source. To make connections, align keyway, insert plug, and rotate threaded collar fully clockwise.

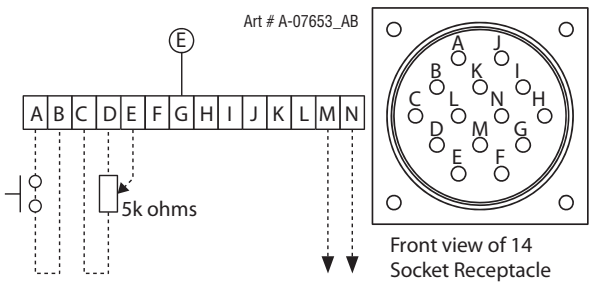


Figure 4-2: 14-Socket Receptacle

Socket Pin	Function
A	Torch Switch Input (24V) to (connect pins A & B to turn on welding current).
B	Torch Switch Input (0V) to energize weld current (connect pins A & B to turn on welding current).
C	5k ohm (maximum) connection to 5k ohm remote control potentiometer.
D	Zero ohm (minimum) connection to 5k ohm remote control potentiometer.
E	Wiper arm connection to 5k ohm remote control potentiometer.
G	Mains Earth.
F,H,I,J, K,L	Not Used.
M	OK to move current detect signal for robotics applications.
N	OK to move current detect signal for robotics applications.

Table 4-1: Socket Pin Functions

3. **Positive Terminal:** Welding current flows from the Power Source via heavy duty Dinse type terminal. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

4. **Negative Terminal:** Welding current flows from the Power Source via heavy duty Dinse type terminal. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the bayonet terminal.

5. **Gas Outlet:** Torch / Gas Terminal is an all-in-one design of the Gas Outlet and the Negative Terminal. Gas Outlet is a 5/8-18 UNF female gas fitting.

6. **ON/OFF Switch:** This switch connects the Primary supply voltage to the inverter when in the ON position. This enables the Power Supply.

WARNING

When the welder is connected to the Primary supply voltage, the internal electrical components may be at 240V potential with respect to earth.

7. **Input Cable:** The input cable connects the Primary supply voltage to the equipment.

8 . **Gas Inlet:** The Gas Inlet is a 5/8-18 UNF female gas fitting.

4.02 Weld Process Selection for Transtig 300 AC/DC

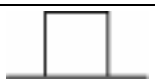
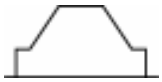
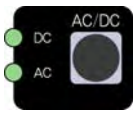
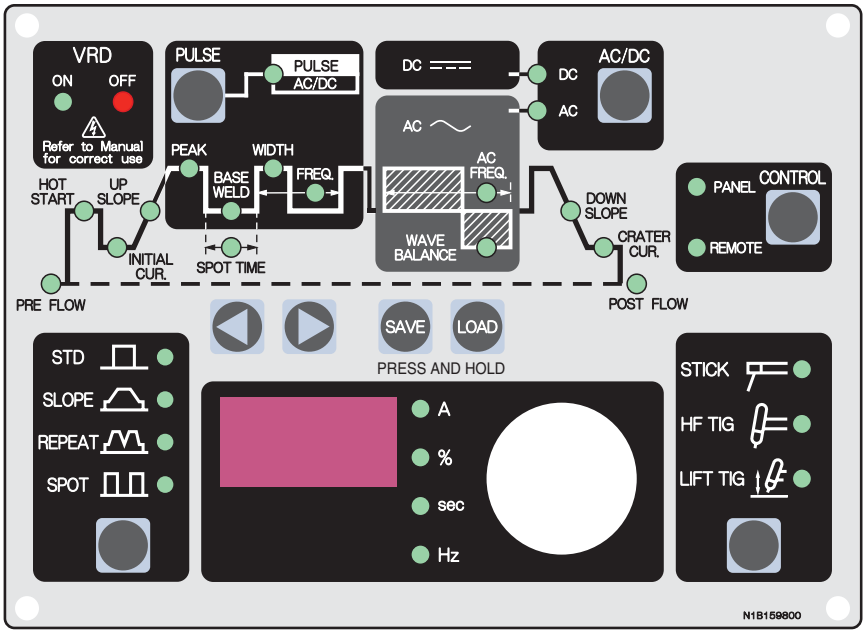
Weld Process Selection	Weld Mode: STICK	Weld Mode: HF TIG	Weld Mode: LIFT TIG	Description
 *STD*	Yes	Yes	Yes	2T operation in TIG Modes using remote devices to control contactor & current
 *SLOPE*	No	Yes	Yes	4T operation in TIG Modes with crater fill using a remote contactor device to control sequence.
REPEAT	No	Yes	Yes	4T operation in TIG Modes with repeat operation and crater fill using a remote contactor device.
SPOT	No	Yes	No	2T operation spot welding in HF TIG using a remote contactor device.
PULSE ON/OFF	No	Yes	Yes	Pulse operation in TIG Modes
	Yes	Yes	Yes	Selects AC or DC weld current
Operation PANEL/REMOTE	Yes	Yes	Yes	Selects mode of operation: Panel or Remote

Table 4-2: Weld Process selection versus Weld Mode for Transtig 300 AC/DC

4.03 Weld Parameter Descriptions for Transtig 300 AC/DC

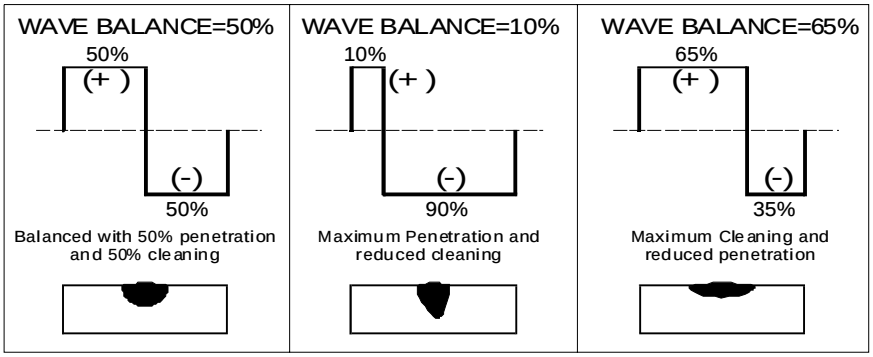


Art # A-07237_AC

Figure 4-3: Transtig 300 AC/DC Front Panel

Parameter	Description
PRE-FLOW	This parameter operates in TIG modes only and is used to provide gas to the weld zone prior to striking the arc, once the torch trigger switch has been pressed. This control is used to dramatically reduce weld porosity at the start of a weld.
HOT START	This parameter operates in all weld modes except Lift TIG mode and is used to heat up the weld zone in TIG modes or improve the start characteristics for stick electrodes. e.g. low hydrogen electrodes. It sets the peak start current on top of the *BASE (WELD)* current. e.g. *HOT START* current = 130 amps when *BASE (WELD)* = 100 amps & *HOT START* = 30 amps
INITIAL CUR.	This parameter operates in *SLOPE* or *REPEAT* (4T) TIG modes only and is used to set the start current for TIG. The Start Current remains on until the torch trigger switch is released after it has been depressed.
UP SLOPE	This parameter operates in TIG modes only and is used to set the time for the weld current to ramp up, after the torch trigger switch has been pressed then released, from INITIAL CUR to PEAK or BASE current

Table 4-3: Transtig 300 AC/DC Front Panel Parameter Description

PEAK CUR.	This parameter sets the PEAK weld current when in *PULSE* mode
WELD	This parameter sets the TIG WELD current in *STD*, *SLOPE*, *REPEAT* and *SPOT* modes when *PULSE* is OFF. This parameter also sets the STICK weld current.
BASE (BackgroundCurrent)	This parameter sets the Background current when in Pulse TIG mode.
SPOT TIME	This parameter sets the duration of the *SPOT TIME* in *HF TIG* mode only
PULSE WIDTH	This parameter sets the percentage on time of the *PULSE FREQUENCY* for PEAK weld current when the *PULSE* is ON.
PULSE FREQ.	This parameter sets the *PULSE FREQUENCY* when the *PULSE* is ON.
AC FREQUENCY	This parameter operates in AC mode only and is used to set the frequency for the AC weld current.
WAVE BALANCE	This parameter is used for aluminum AC TIG mode and is used to set the penetration to cleaning action ratio for the AC weld current. Generally *WAVE BALANCE* is set to 50% for AC *STICK* welding. The *WAVE BALANCE* control changes the ratio of penetration to cleaning action of the AC TIG welding arc. Maximum weld penetration is achieved when the *WAVE BALANCE* control is set to 10%. Maximum cleaning of heavily oxidised aluminium or magnesium alloys is achieved when the *WAVE BALANCE* control is set to 65%. 
DOWN SLOPE	This parameter operates in TIG modes only and is used to set the time for the weld current to ramp down, after the torch trigger switch has been pressed, to *CRATER CUR.* This control is used to eliminate the crater that can form at the completion of a weld.
CRATER CUR.	This parameter operates in *SLOPE* or *REPEAT* (4T) TIG modes only and is used to set the finish current for TIG. The CRATER Current remains ON until the torch trigger switch is released after it has been depressed.
POST-FLOW	This parameter operates in TIG modes only and is used to adjust the post gas flow time once the arc has extinguished. This control is used to dramatically reduce oxidation of the tungsten electrode.
	The SAVE/LOAD buttons are used to save and retrieve a total number of 5 programs into the 300AC/DC memory.

NOTE

The Save/Load bottons must be depressed for 3 seconds to store settings.

4.04 Weld Parameters for Transtig 300 AC/DC

Weld Parameter	Parameter Range	Factory Setting	Incremental Unit	Weld Mode		
				STICK	HF TIG	LIFT TIG
PRE-FLOW	0.0 to 1.0 sec	0 sec	0.1 sec	No	Yes	Yes
HOT START	0 to 70A	20A	1A	Yes	Yes	No
INITIAL CUR.	5 to 300A	30A	1A	No	Yes	Yes
UP SLOPE	0 to 15 sec	1 sec	0.1 sec	No	Yes	Yes
PULSE PEAK CUR.	5 to 300A	120A	1A	No	Yes	Yes
PULSE BASE CUR.	5 to 300A	80A	1A	No	Yes	Yes
WELD CUR (TIG)	5 to 300A	80A	1A	No	Yes	Yes
WELD CUR (STICK)	5 to 300A	80A	1A	Yes	No	No
SPOT TIME	0.5 to 5.0 sec	2 sec	0.1 sec	No	Yes	Yes
PULSE WIDTH	15 to 80%	50%	1%	No	Yes	Yes
PULSE FREQ.	0.5 to 500Hz	100.0Hz	See Table 4-5	No	Yes	Yes
AC FREQUENCY	15 to 150Hz	60Hz	1Hz	Yes	Yes	Yes
WAVE BALANCE	10 to 65%	20%	1%	Yes	Yes	Yes
DOWN SLOPE	0 to 25 sec	3 sec	0.1 sec	No	Yes	Yes
CRATER CUR.	5 to 300A	30A	1A	No	Yes	Yes
POST-FLOW	0.0 to 60 sec	10 sec	0.1 sec	No	Yes	Yes

Table 4-4: Weld Parameters for Transtig 300 AC/DC

***PULSE FREQ.* Range**	**Incremental Unit**
0.5 to 20Hz	0.1Hz
20 to 100Hz	1Hz
100 to 500Hz	5Hz

Table 4-5: PULSE FREQ. Range and Incremental Units

4.05 Power Source Features

Feature	Description
New Digital Control	• Almost all welding parameters are adjustable
Touch Panel Switches	• Touch switches eliminate mechanical damage
Front Control Cover	• Protects front panel controls
Digital Meter	• Displays selected weld parameter value • Displays weld current when welding • Displays weld current for 20 seconds after weld has been completed • A selected weld parameter value can be adjusted at any time even while welding
Intelligent Fan Control	• The intelligent cooling system is designed to reduce dust and foreign material build-up, whilst providing optimum cooling • Fan speed reduces approximately 30 seconds after machine is turned on • Fan speed increases when internal components reaches operating temperature
ON/OFF Switch	• Primary voltage Supply ON/OFF switch located on rear panel
Voltage Reduction Device (VRD)	Reduces the OCV when the power supply is not in use. Eliminates the need for add on voltage reducers and has no effect on arc starting. • VRD fully complies to AS 60974.1 • When Stick mode is selected the green VRD light is ON when not welding and red when welding • When in TIG modes VRD is OFF.
Control Knob	• For the selected weld parameter, rotating the knob clockwise increases the parameter • Rotating the knob counter-clockwise decreases the parameter • A selected weld parameter value can be adjusted at any time even while welding • Pushing the knob in displays actual arc voltage
Self Diagnosis using Error Codes	• An error code is displayed on the *Digital Meter* when a problem occurs with Primary supply voltage or internal component problems. Refer to troubleshooting guide.

Table 4-6: Power Source Features

Feature	Description
Save/Load Function	• A total number of 5 programs can be saved into the 300 AC/DC memory. ***SAVE* the Current Weld Parameters into Memory** • Press and HOLD the *SAVE* button. Beep will sound and the Digital Meter will show a number 1. • Select a memory location by rotating the control knob, 1 to 5 is displayed on the meter. • After selecting the desired memory location (i.e. 1 to 5), press the right scroll button and the machine will give a beep to confirm the weld parameters from the control panel are saved. **NOTE:** The Save/Load buttons must be depressed for 3 seconds to store settings. ***LOAD* (retrieve) a Program to Control Panel** • Press and HOLD the *LOAD* button. Beep will sound and the Digital Meter display will show a number 1. • Select a memory location by rotating the control knob, 1 to 5 is displayed on the meter. After selecting the desired memory location (i.e. 1 to 5), press the right scroll button and the machine will give a beep to confirm the weld parameters are loaded onto the control panel. **NOTE:** The Save/Load buttons must be depressed for 3 seconds to store settings

Table 4-6:Power Source Features (con't)

SECTION 5:
SET-UP FOR SMAW (STICK) AND GTAW (TIG)

Conventional operating procedures apply when using the Welding Power Source, i.e. connect work lead directly to work piece and electrode lead is used to hold electrode. Wide safety margins provided by the coil design ensure that the Welding Power Source will withstand short-term overload without adverse effects. The welding current range values should be used as a guide only. Current delivered to the arc is dependent on the welding arc voltage, and as welding arc voltage varies between different classes of electrodes, welding current at any one setting would vary according to the type of electrode in use. The operator should use the welding current range values as a guide, then finally adjust the current setting to suit the application.

WARNING

Before connecting the work clamp to the work and inserting the electrode in the electrode holder make sure the Primary power supply is switched off.

CAUTION

Remove any packaging material prior to use. Do not block the air vents at the front or rear or sides of the Welding Power Source.

CAUTION

DO NOT change the Weld Mode or Weld Process Mode until after POST-FLOW time has finished.

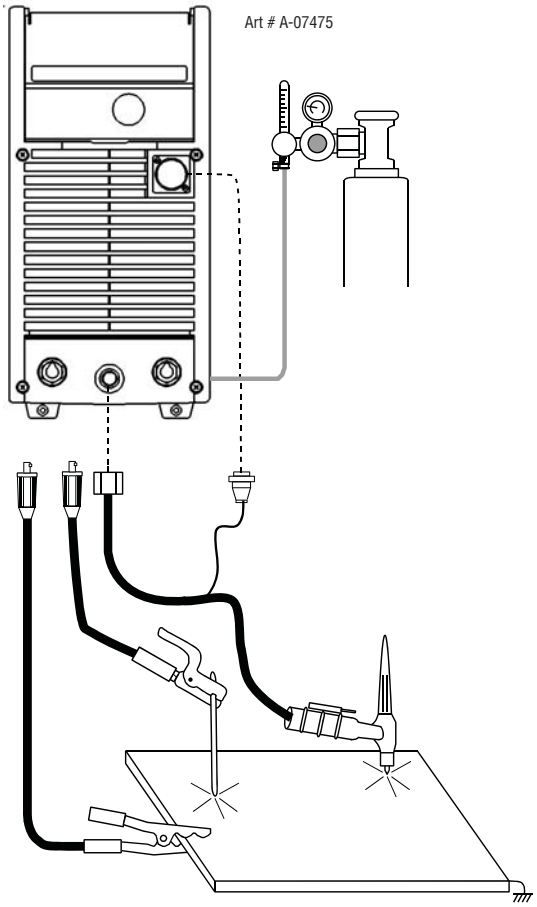


Figure 5-1: Transtig 300 AC/DC Set-up

NOTES

SECTION 6:
SEQUENCE OF OPERATION

Scroll Buttons are used to select the parameters to be set. The LED's show which function is being adjusted on the weld sequence graph. Refer to the Symbols Table located in the front of the manual for Symbol descriptions.

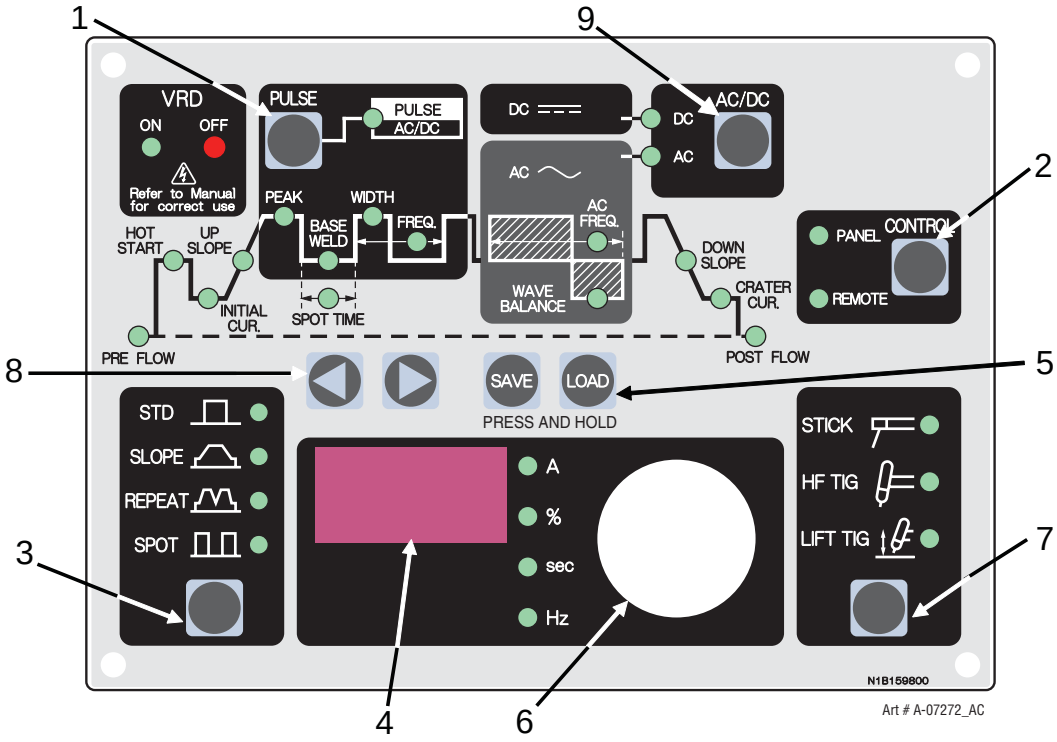


Figure 6-1: 300 AC/DC Front Panel

1. **Pulse Function**: Pressing this button enables the TIG current pulse functions.
2. **Remote Current Function**: Pressing this buttons enables remote current functions.
3. **TIG Mode Functions**: Pressing this button scrolls through the output TIG function modes (Standard, Slope, Slope w/repeat, Spot).
4. **Digital LED Display**: Welding amperage and parameter values are displayed in this window. Internal warnings such as over temperature, low or high input voltage applied are signaled to the operator by a warning sound and error message on the screen.
5. **Save/Load Buttons**: By using the Save & Load buttons the operator can easily save up to 5 welding parameter programs. The Save/Load bottons must be depressed for 3 seconds to store settings.
6. **Control Knob**: Allows the operator to adjust the output amperage within the entire range of the power source and sets each parameter value.
7. **Process Button**: This button selects between STICK, HF TIG and Lift TIG mode.
8. **Scroll Buttons**: Used to select the parameters to be set. The LED's show which function is being adjusted on the Sequence Graph.
9. **AC/DC Button**: Selects between AC or DC welding output.

6.01 Stick Welding

- *Connect work lead to negative terminal*
- *Connect electrode lead to positive terminal*
- *Switch machine on*
- *Set* AC *or* DC *weld current. If* AC *is selected then set* AC FREQ *to 60Hz &* WAVE BALANCE *to 50%.*
- *Set Contractor*
- *Connect remote control device if required*

Use the Scroll Buttons to move to the parameter to be set. The LED will show which function is being adjusted on the weld sequence graph. Use the control knob to adjust each parameter.

- *Set* HOT START
- *Set* WELD *current*

Commence welding

6.02 AC or DC HF TIG Welding

- Connect work lead to positive terminal
- Connect TIG torch to gas terminal
- Switch machine on
- Set *AC* or *DC* weld current. If *AC* is selected then set *AC FREQ* & *WAVE BALANCE*
- Connect remote control device if required

Use the Scroll Buttons to move to the parameter to be set. The LED will show which function is being adjusted on the weld sequence graph. Use the control knob to adjust each parameter.

- Set *PRE-FLOW* time
- Set *HOT START* current
- Set *POST-FLOW* time
- Set *(WELD) PEAK CUR* current
- Set *POST-FLOW* time

Slope Mode Parameters if required

- Set *INITIAL CUR* current
- Set *UP SLOPE* time
- Set (WELD) *PEAK CUR* current
- Set *BASE* current
- Set *DOWN SLOPE* time
- Set *CRATER CUR* current

Pulse Mode parameters if required

- Set *PULSE WIDTH* % for *PEAK CURRENT*
- *Set PEAK CURRENT*
- Set *PULSE FREQ*

Commence welding

6.03 Slope Mode Sequence

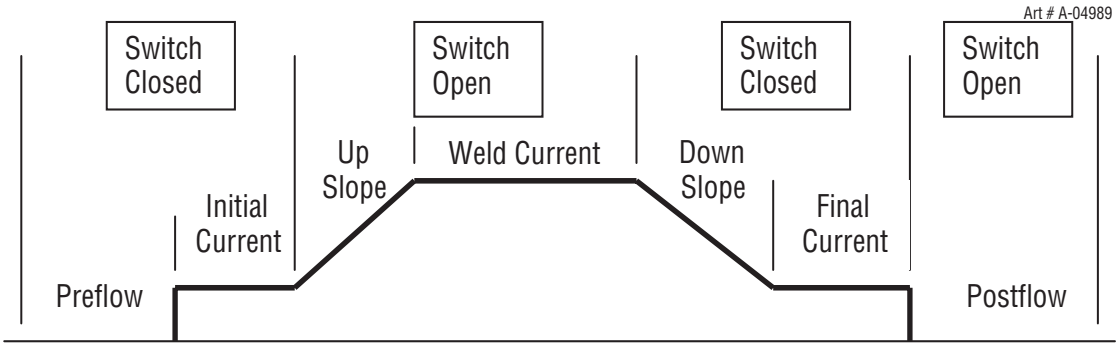


Figure 6-2: Slope Mode Sequence

NOTE

Slope function operates with a Remote ON/OFF device only

1. To start Slope sequence Close remote switch contacts. Once the welding arc is established the Power Source will maintain initial current setting as long as the remote switch contacts are closed.
   a. In the HF TIG mode, after Preflow time, High Frequency is present at the torch. When the torch is positioned close to the work the welding current will transfer to the work and establish the arc at the initial current setting.
   b. In the Lift TIG mode, after Preflow time, Lift Start current is present at the torch. When the electrode is touched to the work and lifted off, the welding arc is established at the initial current setting.
2. Open Remote Switch – current increases to weld current. Once welding arc has reached weld current the power source will maintain weld current as long as the remote switch contacts are open.
3. Close Remote Switch – Welding current decreases to final current setting. Once final welding current is reached the power source will maintain final current setting as long as the remote switch contacts are closed.
4. Open Remote Switch – Welding arc stops and post flow begins.

6.04 Slope Mode with Repeat Sequence

The repeat function is operated during the down slope cycle of the Slope Sequence and is active through the down slope period only. During the down slope period, by opening the Remote Switch contacts, the current will increase back to weld current. Within the Down Slope period the repeat function can be operated as many times as desired. To continue slope cycle and end slope sequence close remote switch contacts and allow weld current to reach final current setting. Once final current setting is reached, opening the Remote Switch again will turn off the welding arc and post flow begins.

6.05 Pulse Controls

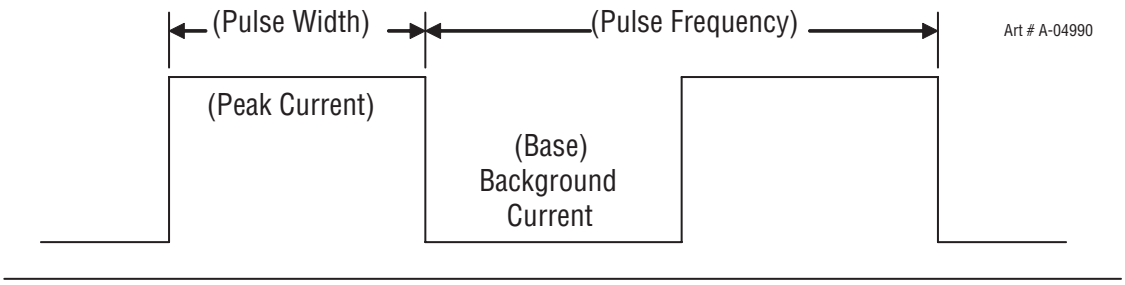


Figure 6-3: Pulse Controls

The Pulse controls are used primarily to control heat input. Pulse offers a number of advantages as follows:

1) Control puddle – size and fluidity (especially out of position).
2) Increase penetration
3) Travel speed control
4) Better consistent quality
5) Decreased distortion on lighter or thinner materials

Pulse-current provides a system in which the welding current continuously changes between two levels. During the periods of Peak current, heating and fusion takes place, and during the background (base) current periods, cooling and solidification take place. Pulse Width is the time in one cycle the current remains at the peak current setting. Pulse Frequency, measured in Hertz, is the number of cycles per second the current travels between peak and background current settings. It is as if the foot rheostat were moved up and down to increase and decrease the welding current on a regular basis. The faster you moved the foot rheostat up and down the faster the frequency.

6.06 Save-Load Operation

A total number of 5 programs can be saved into the Transtig 300 AC/DC memory.

SAVE the Current Weld Parameters into Memory

- Press and HOLD the SAVE button. Beep will sound and digital display will show a number 1.
- Select a memory location by rotating the control knob, 1 to 5 is displayed on the meter.
- After selecting the desired memory location (i.e. 1 to 5), press the parameter button and the machine will beep to confirm the weld parameters from the control panel are saved. The Save/Load bottons must be depressed for 3 seconds to store settings.

LOAD (retrieve) a Program to Control Panel

- Press and HOLD the LOAD button. Beep will sound and digital display will show a number 1.
- Select a memory location by rotating the control knob, 1 to 5 is displayed on the meter.
- After selecting the desired memory location (i.e. 1 to 5), press the parameter button and the machine will beep to confirm the weld parameters are loaded onto the control panel. The Save/Load bottons must be depressed for 3 seconds to store settings.

SECTION 7:
BASIC TIG WELDING GUIDE

7.01 Explanation of "Fluttery Arc" when AC TIG Welding on Aluminum

The following will assist in understanding the phenomenon of Arc Flutter, also referred to as Arc Rectification.

The basic thesis is that the fluttering is caused by lack of oxide in the weld pool.

The oxide layer on the plate reduced the energy for electron emission. Electron emission from the weld pool (DC+) causes the oxide layers to be disrupted, the so-called "cleaning action". However once the cleaning action has produced a mirror like surface on the weld pool, the effect of the oxide layer is limited because the oxide layer has dissipated. This makes electron emission from the weld pool more difficult and increases the chance of arc instability.

This idea is supported by the observation that once fluttering starts it can be made to stop by working the arc away from the mirror like weld pool to an area of oxide coated material. As soon as this is done the arc settles back to a stable condition. So while the arc is "consuming" oxide coated plate the instability does not occur. But once the arc is stationary, the pool becomes thoroughly "cleaned" by election emission, the fluttering begins.

Tests conducted on various types of AC TIG power sources, Fluttery Arc is not confined to one type of power source or its' design, both conventional and inverter types suffer from the same problem.

AC TIG on aluminum

1. The Problem: Arc appears unstable and pulses or flutters. ie. appears to rapidly change welding current.

Conditions that accentuate arc flutter:	Conditions that minimizes arc flutter:
• Cold work piece	• Preheat the work piece
• Very short arc length	• Increase the arc length
• Weld pool crater about 0.39" to 0.47" (10 to 12mm) diameter	• Introduce filler rod material to the weld pool, which introduces oxides
• Arc field in one spot to produce "mirror" clean weld pool	• Move the weld pool around to introduce oxides to the weld pool
• Increased cleaning action i.e. Prolonged oxide emission from a stationary weld pool increases the likelihood of arc flutter	• Decrease the cleaning action by turning the *WAVE BALANCE* to below 50% or move the weld pool around
• Accentuated when tungsten running near its current capacity, i.e. Molten ball on end	• Use a larger diameter tungsten electrode

Table 7-1: Reduction of Arc Flutter

2. Conclusion: Fluttery Arc in AC TIG is a physical phenomenon independent of machine design.

7.02 Electrode Polarity

Connect the TIG torch to the - / TORCH terminal and the work lead to the + / WORK terminal for direct current straight polarity. Direct current straight polarity is the most widely used polarity for DC TIG welding. It allows limited wear of the electrode since 70% of the heat is concentrated at the work piece.

7.03 Tungsten Electrode Current Ranges

Electrode Diameter	AC Current (Amps)	DC Current (Amps)
0.040” (1.0mm)	30 – 70	30 – 60
1/16” (1.6mm)	60 – 95	60 – 115
3/32” (2.4mm)	125 – 150	100 – 165
1/8” (3.2mm)	130 – 225	135 – 200
5/32” (4.0mm)	190 – 280	190 – 280
3/16” (4.8mm)	250 – 340	250 – 340

Table 7-2: Current ranges for various tungsten electrode sizes

7.04 Tungsten Electrode Types

Electrode Type (Ground Finish)	Welding Application	Features	Color Code
Thoriated 2%	DC welding of mild steel, stainless steel and copper	Excellent arc starting, long life, high current carrying capacity	Red
Zirconated 1%	High quality AC welding of aluminium, magnesium and their alloys	Self cleaning, long life, maintains balled end, high current carrying capacity	White
Ceriated 2%	AC & DC welding of mild steel, stainless steel, copper, aluminium, magnesium and their alloys	Longer life, more stable arc, easier starting, wider current range, narrower more concentrated arc	Grey

Table 7-3: Tungsten Electrode Types

7.05 Guide for Selecting Filler Wire Diameter

NOTE

The filler wire diameter specified in Table 7-4 is a guide only, other diameter wires may be used according to the welding application

Filler Wire Diameter	AC Current Range (Amps)	DC Current Range (Amps)
1/16” (1.6 mm)	30 - 95	20 - 90
3/32” (2.4 mm)	125 - 160	65 - 115
1/8” (3.2 mm)	180 - 240	100 - 165
3/16” (4.8 mm)	220 - 320	200 - 350

Table 7-4: Filler Wire Selection Guide

7.06 Shielding Gas Selection

Alloy	Shielding Gas
Aluminium & alloys	Welding Argon
Carbon Steel	Welding Argon
Stainless Steel	Welding Argon
Copper	Welding Argon

Table 7-5: Shielding Gas Selection

7.07 TIG Welding Parameters for Low Carbon & Low Alloy Steel Pipe

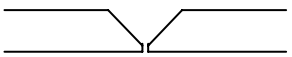
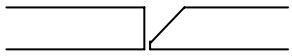
Electrode Type & Diameter	Current Range DC Amperes	Filler Rod for Root Pass	Joint Preparation
Thoriated 2% 3/32” (2.4 mm)	120 - 170	Yes	
Thoriated 2% 3/32” (2.4 mm)	100 - 160	Yes	
Thoriated 2% 3/32” (2.4 mm)	90 - 130	No	

Table 7-6: TIG Welding Parameters for Low Carbon & Low Alloy Steel Pipe

7.08 Welding Parameters for Aluminum

Base Metal Thickness	AC Current for Aluminum	Tungsten Electrode Diameter	Filler Rod Diameter (if required)	Argon Gas Flow Rate Liters/min	Joint Type
0.040” 1.0mm	30-45 35-50	0.040” 1.0mm	1/16” 1.6mm	5-7	Butt/Corner Lap/ Fillet
0.045” 1.2mm	40-60 45-70	0.040” 1.0mm	1/16” 1.6mm	5-7	Butt/Corner Lap/ Fillet
1/16” 1.6mm	60-85 70-95	1/16” 1.6mm	1/16” 1.6mm	7	Butt/Corner Lap/ Fillet
1/8” 3.2mm	125-150 130-160	3/32” 2.4mm 1/8” 3.2mm	3/32” 2.4mm	10	Butt/Corner Lap/Fillet
3/16” 4.8mm	180-225 190-240	1/8” 3.2mm	1/8” 3.2mm	10	Butt/Corner Lap/ Fillet
¼” 6.4mm	240-280 250-320	3/16” 4.8mm	3/16” 4.8mm	13	Butt/Corner Lap/ Fillet

Table 7-7: AC TIG Welding Parameters

7.09 Welding Parameters for Steel

Base Metal Thickness	DC Current for Mild Steel	DC Current for Stainless Steel	Tungsten Electrode Diameter	Filler Rod Diameter (if required)	Argon Gas Flow Rate Liters/min	Joint Type
0.040” 1.0mm	35-45 40-50	20-30 25-35	0.040” 1.0mm	1/16” 1.6mm	5-7	Butt/Corner Lap/ Fillet
0.045” 1.2mm	45-55 50-60	30-45 35-50	0.040” 1.0mm	1/16” 1.6mm	5-7	Butt/Corner Lap/ Fillet
1/16” 1.6mm	60-70 70-90	40-60 50-70	1/16” 1.6mm	1/16” 1.6mm	7	Butt/Corner Lap/ Fillet
1/8” 3.2mm	80-100 90-115	65-85 90-110	1/16” 1.6mm	3/32” 2.4mm	7	Butt/Corner Lap/ Fillet
3/16” 4.8mm	115-135 140-165	100-125 125-150	3/32” 2.4mm	1/8” 3.2mm	10	Butt/Corner Lap/ Fillet
¼” 6.4mm	160-175 170-200	135-160 160-180	1/8” 3.2mm	5/32” 4.0mm	10	Butt/Corner Lap/ Fillet

Table 7-8: DC TIG Welding Parameters

SECTION 8:
BASIC ARC WELDING GUIDE

8.01 Electrode Polarity

Stick electrodes are generally connected to the '+' terminal and the work lead to the '-' terminal but if in doubt consult the electrode manufacturers literature.

8.02 Effects of Stick Welding Various Materials

High Tensile and Alloy Ateels

The two most prominent effects of welding these steels are the formation of a hardened zone in the weld area, and, if suitable precautions are not taken, the occurrence in this zone of under-bead cracks. Hardened zone and under-bead cracks in the weld area may be reduced by using the correct electrodes, preheating, using higher current settings, using larger electrodes sizes, short runs for larger electrode deposits or tempering in a furnace.

Manganese Steels

The effect on manganese steel of slow cooling from high temperatures is to embrittle it. For this reason it is absolutely essential to keep manganese steel cool during welding by quenching after each weld or skip welding to distribute the heat.

Cast Iron

Most types of cast iron, except white iron, are weldable. White iron, because of its extreme brittleness, generally cracks when attempts are made to weld it. Trouble may also be experienced when welding white-heart malleable, due to the porosity caused by gas held in this type of iron.

Copper and Alloys

The most important factor is the high rate of heat conductivity of copper, making preheating of heavy sections necessary to give proper fusion of weld and base metal.

Types of Electrodes

Arc Welding electrodes are classified into a number of groups depending on their applications. There are a great number of electrodes used for specialized industrial purposes, which are not of particular interest for everyday general work. These include some low hydrogen types for high tensile steel, cellulose types for welding large diameter pipes, etc. The range of electrodes dealt with in this publication will cover the vast majority of applications likely to be encountered; are all easy to use and all will work on even the most basic of welding machines.

Metals being joined	Electrode	Comments
Mild Steel	6013	Ideal electrodes for all general purpose work. Features include outstanding operator appeal, easy arc starting and low spatter.
Mild Steel	7014	All positional electrode for use on mild and galvanized steel furniture, plates, fences, gates, pipes and tanks etc. Especially suitable for vertical-down welding.
Cast Iron	99% Nickel	Suitable for joining all cast irons except white cast iron.
Stainless Steel	318L-16	High corrosion resistance. Ideal for dairy work, etc.
Copper, Bronze, Brass, etc.	Bronze 5.7 ERCUSI-A	Easy to use electrode for marine fittings, water taps and valves, water trough float arms, etc. Also for joining copper to steel and for bronze overlays on steel shafts.
High alloy steels, dissimilar metals, crack resistant, all hard-to-weld jobs.	312-16	It will weld most problematic jobs such as springs, shafts, broken joints, mild steel to stainless and alloy steel. Not suitable for Aluminium.

Table 8-1: Types of Electrodes

SECTION 9:
ROUTINE MAINTENANCE

The only routine maintenance required for the power supply is a thorough cleaning and inspection, with the frequency depending on the usage and the operating environment.

The unit should be wiped clean as necessary with solvents that are recommended for cleaning electrical apparatus. Turn Power Switch to OFF before proceeding. Internal cleaning of the unit should be done every 6 months by an authorized Cigweld Service Center to remove any accumulated dirt and dust. This may need to be done more frequently under exceptionally dirty conditions.

CAUTION

Do not blow air into the power supply during cleaning. Blowing air into the unit can cause metal particles to interfere with sensitive electrical components and cause damage to the unit.

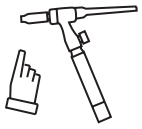
Warning!
Disconnect input power before maintaining.

Maintain more often if used under severe conditions

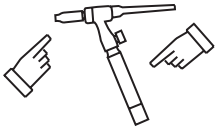
Each Use

Visual check of regulator and pressure

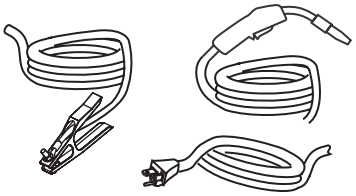
Visual check of torch Consumable parts



Weekly



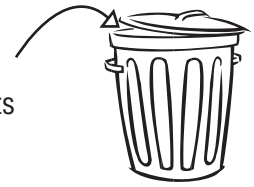
Visually inspect the torch body and consumables



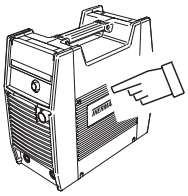
Visually inspect the cables and leads. Replace as needed

3 Months

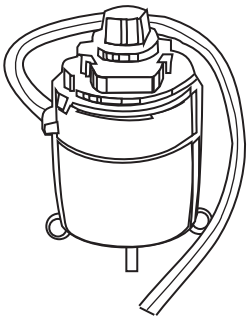
Replace all broken parts



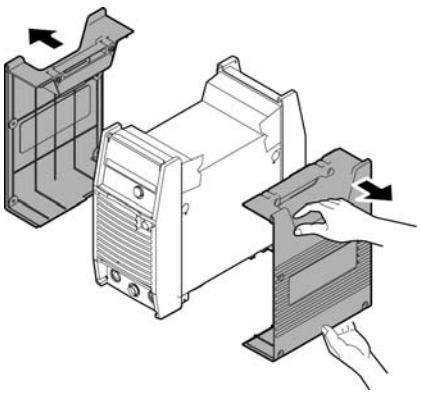
Clean exterior of power supply



6 Months



Bring the unit to an authorized CIGWELD Service Provider to remove any accumulated dirt and dust from the interior. This may need to be done more frequently under exceptionally dirty conditions.



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SECTION 10:
BASIC TROUBLESHOOTING

WARNING

There are extremely dangerous voltages and power levels present inside this product. Do not attempt to open or repair unless you are an accredited Cigweld Service Provider and you have had training in power measurements and troubleshooting techniques.

If major complex subassemblies are faulty, then the Welding Power Source must be returned to an accredited Cigweld Service Agent for repair.

The basic level of troubleshooting is that which can be performed without special equipment or knowledge.

10.01 TIG Welding Problems

Weld quality is dependent on the selection of the correct consumables, maintenance of equipment and proper welding technique.

	Description	Possible Cause	Remedy
1	Excessive bead build-up or poor penetration or poor fusion at edges of weld.	Welding current is too low.	Increase weld current and/or faulty joint preparation.
2	Weld bead too wide and flat or undercut at edges of weld or excessive burn through.	Welding current is too high.	Decrease weld current.
3	Weld bead too small or insufficient penetration or ripples in bead are widely spaced apart.	Travel speed too fast.	Reduce travel speed.
4	Weld bead too wide or excessive bead build up or excessive penetration in butt joint.	Travel speed too slow.	Increase travel speed.
5	Uneven leg length in fillet joint.	Wrong placement of filler rod.	Re-position filler rod.

Table 10-1: TIG Welding Problems

	Description		Possible Cause		Remedy
6	Electrode melts when arc is struck.	A	Electrode is connected to the '+' terminal.	A	Connect the electrode to the '–' terminal.
		B	*WAVE BALANCE* is greater than 50%.	B	Reduced *WAVE BALANCE* to below 50% or increase the electrode size.
7	Dirty weld pool.	A	Electrode contaminated through contact with work piece or filler rod material.	A	Clean the electrode by grinding off the contaminates.
		B	Gas contaminated with air.	B	Check gas lines for cuts and loose fitting or change gas cylinder.
8	Electrode melts or oxidizes when an arc is struck.	A	No gas flowing to welding region.	A	Check the gas lines for kinks or breaks and gas cylinder contents.
		B	Torch is clogged with dust.	B	Clean torch.
		C	Gas hose is cut.	C	Replace gas hose.
		D	Gas passage contains impurities.	D	Disconnect gas hose from torch then raise gas pressure and blow out impurities.
		E	Gas regulator turned OFF.	E	Turn ON.
		F	Torch valve is turned OFF.	F	Turn ON.
		G	The electrode is too small for the welding current.	G	Increase electrode diameter or reduce the welding current.
		H	*WAVE BALANCE* is set above 50%.	H	Reduced *WAVE BALANCE* to below 50% or increase the electrode size.
9	Poor weld finish.		Inadequate shielding gas.		Increase gas flow or check gas line for gas flow problems.
10	Arc flutters during TIG welding.	A	Tungsten electrode is too large for the welding current.	A	Select the right size electrode. Refer to Basic TIG Welding guide.
		B	Absence of oxides in the weld pool.	B	Refer Basic TIG Welding Guide for ways to reduce arc flutter.

Table 10-1 (continued): TIG Welding Problems

Description	Possible Cause	Remedy
11 Welding arc cannot be established.	A Work clamp is not connected to the work piece or the work/torch leads are not connected to the right welding terminals.	A Connect the work clamp to the work piece or connect the work/torch leads to the right welding terminals.
	B Torch lead is disconnected.	B Connect it to the '–' terminal.
	C Gas flow incorrectly set, cylinder empty or the torch valve is OFF.	C Select the right flow rate, change cylinders or turn torch valve ON.
12 Arc start is not smooth.	A Tungsten electrode is too large for the welding current.	A Select the right size electrode. Refer to Basic TIG Welding Guide.
	B The wrong electrode is being used for the welding job.	B Select the right electrode type. Refer to Basic TIG Welding Guide.
	C Gas flow rate is too high.	C Select the correct rate for the welding job. Refer to Basic TIG Welding Guide.
	D Incorrect shielding gas is being used.	D Select the right shielding gas. Refer to Basic TIG Welding Guide.
	E Poor work clamp connection to work piece.	E Improve connection to work piece.

Table 10-1 (continued): TIG Welding Problems

10.02 Stick Welding Problems

Description	Possible Cause	Remedy
1 Gas pockets or voids in weld metal (Porosity).	A Electrodes are damp. B Welding current is too high. C Surface impurities such as oil, grease, paint, etc.	A Dry electrodes before use. B Reduce welding current. C Clean joint before welding.
2 Crack occurring in weld metal soon after solidification commences.	A Rigidity of joint. B Insufficient throat thickness. C Cooling rate is too high.	A Redesign to relieve weld joint of severe stresses or use crack resistance electrodes. B Travel slightly slower to allow greater build up in throat. C Preheat plate and cool slowly.
3 A gap is left by failure of the weld metal to fill the root of the weld.	A Welding current is too low. B Electrode too large for joint. C Insufficient gap. D Incorrect sequence.	A Increase welding current B Use smaller diameter electrode. C Allow wider gap. D Use correct build-up sequence.

Table 10-2: Stick Welding Problems

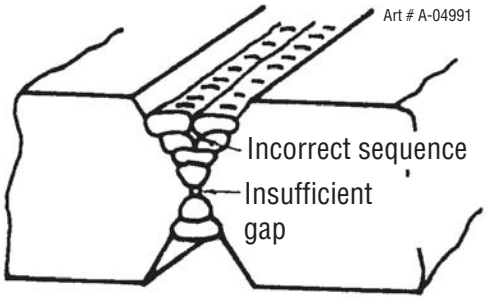
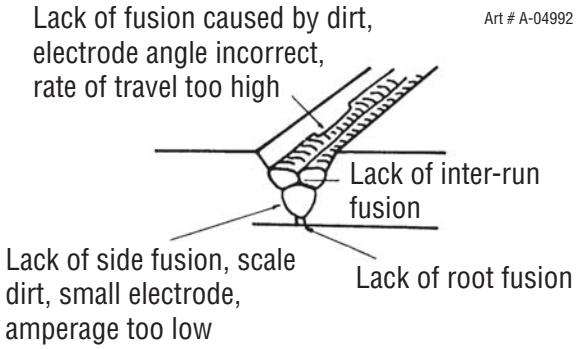


Figure 10-1: Example of Insufficient Gap or Incorrect Sequence

Description	Possible Cause	Remedy
4 Portions of the weld run do not fuse to the surface of the metal or edge of the joint.	A Small electrodes used on heavy cold plate.	A Use larger electrodes and pre-heat the plate.
	B Welding current is too low.	B Increase welding current.
	C Wrong electrode angle.	C Adjust angle so the welding arc is directed more into the base metal.
	D Travel speed of electrode is too high.	D Reduce travel speed of electrode.
	E Scale or dirt on joint surface.	E Clean surface before welding.

Table 10-2 (continued): Stick Welding Problems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Lack of fusion caused by dirt, electrode angle incorrect, rate of travel too high
Lack of inter-run fusion
Lack of side fusion, scale dirt, small electrode, amperage too low
Lack of root fusion

Figure 10-2: Example of Lack of Fusion

Description	Possible Cause	Remedy
5 Non-metallic particles are trapped in the weld metal (slag inclusion).	A Non-metallic particles may be trapped in undercut from previous run.	A If bad undercut is present, clean slag out and cover with a run from a smaller diameter electrode.
	B Joint preparation too restricted.	B Allow for adequate penetration and room for cleaning out the slag.
	C Irregular deposits allow slag to be trapped.	C If very bad, chip or grind out irregularities.
	D Lack of penetration with slag trapped beneath weld bead.	D Use smaller electrode with sufficient current to give adequate penetration. Use suitable tools to remove all slag from corners.
	E Rust or mill scale is preventing full fusion.	E Clean joint before welding.
	F Wrong electrode for position in which welding is done.	F Use electrodes designed for position in which welding is done, otherwise proper control of slag is difficult.

Table 10-2 (continued): Stick Welding Problems

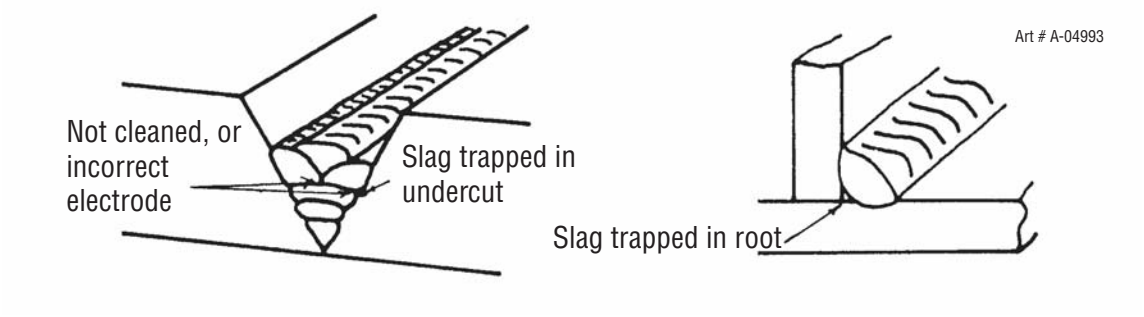


Figure 10-3: Examples of Slag Inclusion

10.03 Power Source Problems

Description	Possible Cause	Remedy
1 The welding arc cannot be established.	A The Primary supply voltage has not been switched ON. B The Welding Power Source switch is switched OFF. C Loose connections internally.	A Switch ON the Primary supply voltage. B Switch ON the Welding Power Source. C Have an accredited Cigweld Service Provider repair the connection.
2 Maximum output welding current can not be achieved with nominal Mains supply voltage.	Defective control circuit.	Have an accredited Cigweld Service Provider repair the connection.
3 Welding current reduces when welding.	A Loose welding cable connections. B Incorrect welding cable size. C Improper input connections. D Poor electrode condition. E Wrong welding polarity.	A Tighten all welding cable connections. B Use proper size and type of cable. C Refer to Section 2.05 Electrical Input Requirements. D Replace electrode. E Verify output torch connections.
4 No gas flow when the torch trigger switch is depressed.	A Gas hose is cut. B Gas passage contains impurities. C Gas regulator turned OFF. D Torch trigger switch lead is disconnected or switch/cable is faulty.	A Replace gas hose. B Disconnect gas hose from the rear of Power Source then raise gas pressure and blow out impurities. C Turn gas regulator ON. D Reconnect lead or repair faulty switch/cable.

Table 10-3: Power Source Problems

Description	Possible Cause	Remedy
5 Gas flow won't shut OFF.	A Weld Mode (*STD*, *SLOPE*, *REPEAT* or *SPOT*) was changed before *POST-FLOW* gas time had finished.	A Strike an arc to complete the weld cycle. OR Switch machine OFF then ON to reset solenoid valve sequence.
	B Gas valve is faulty.	B Have an accredited Cigweld Service Provider repair or replace the gas valve.
	C Gas valve jammed open.	C Have an accredited Cigweld Service Provider repair or replace the gas valve.
	D *POST-FLOW* control is set to 60 sec.	D Reduce *POST-FLOW* time.
6 The TIG electrode has been contaminated due to the gas flow shutting OFF before the programmed *POST-FLOW* time has elapsed.	The Weld Process Mode (STICK, HF TIG or LIFT TIG) was changed before *POST-FLOW* gas time had finished.	Do not change Weld Process Mode before the *POST-FLOW* gas time had finished.

Table 10-3 (continued): Power Source Problems

SECTION 11:
VOLTAGE REDUCTION DEVICE (VRD)

11.01 VRD SPECIFICATION

Description	TransTIG 300 AC/DC	Notes
VRD Open Circuit Voltage	15.3 to 19.8V	Open circuit voltage between welding terminals.
VRD Resistance	148 to 193 ohms	The required resistance between welding terminals to turn ON the welding power.
VRD Turn OFF Time	0.2 to 0.3 seconds	The time taken to turn OFF the welding power once the welding current has stopped.

Table 11-1: VRD Specification

11.02 VRD MAINTENANCE

Routine inspection and testing (power source):

An inspection of the power source, an insulation resistance test and an earth resistance test should be carried out.

a. For transportable equipment, at least once every 3 months.

b. For fixed equipment, at least once every 12 months.

The owners of the equipment shall keep a suitable record of the periodic tests.

NOTE

A transportable power source is any equipment that is not permanently connected and fixed in the position in which it is operated.

In addition to the above tests and specifically in relation to the VRD fitted to this machine, the following periodic tests should also be conducted by an accredited Cigweld Service Provider.

Description	Required Parameters
VRD Open Circuit Voltage	Less than 20V; at Vin=415V
VRD Turn ON Resistance	Less than 200 ohms
VRD Turn OFF Time	Less than 0.3 seconds

Table 11-2: Periodic Tests

If this equipment is used in a location or an environment with a high risk of electrocution then the above tests should be carried out prior to entering this location.

NOTES

SECTION 12:
POWER SOURCE ERROR CODES

	Description	Possible Cause	Remedy	Remarks
1	E01 error code displayed Temperature sensor TH1 (protects IGBTs) is greater than 80°C for about 1 second.	A The Welding Power Source's duty cycle has been exceeded. B Fan ceases to operate. C Air flow is restricted by vents being blocked.	A Let Power Source cool down then keep within its duty cycle. B Have an accredited Cigweld Service Provider investigate. C Unblock vents then let Power Source cool down.	Weld current ceases. Buzzer sounds constantly. Fan operates at max speed. E01 resets when TH1 decreases to 70°C for about 30 seconds.
2	E02 error code displayed Temperature sensor TH2 (protects secondary diodes) is greater than 80°C for about 1 second.	A The Welding Power Source's duty cycle has been exceeded. B Fan ceases to operate. C Air flow is restricted by vents being blocked.	A Let Power Source cool down then keep within its duty cycle. B Have an accredited Cigweld Service Provider investigate C Unblock vents then let Power Source cool down.	Weld current ceases. Buzzer sounds constantly. Fan operates at max speed. E02 resets when TH2 decreases to 70°C for about 30 seconds.
3	E03 error code displayed Primary (input) current too high.	A Primary current is too high because welding arc is too long. B Mains supply voltage is more than 10% below nominal voltage .	A Reduce length of welding arc. B Have an accredited Cigweld Service Provider or a qualified electrician check for low Mains voltage.	Weld current ceases. Buzzer sounds constantly. Switch machine OFF then ON to reset E03 error.
4	E04 error code displayed Output voltage exceeds the secondary voltage specification.	TIG torch cable and/or work lead are too long or leads are coiled.	Reduce the length of the TIG torch cable and/or work lead or un-coiled leads.	Weld current ceases. Buzzer sounds constantly. Switch machine OFF then ON to reset E04 error.

Table 12-1 Power Source Error Codes

5 E11 error code displayed Over Primary supply (input) voltage at primary capacitors is exceeded for one second.	Primary supply voltage is greater than the nominal voltage plus 10%.	Have an accredited Cigweld Service Provider or a qualified electrician check the Primary voltage.	Weld current ceases. Buzzer sounds contstantly. Error code E11 automatically will reset when the voltage reduces.
6 E14 error code displayed Under mains supply (input) voltage warning primary capacitors is reduced for one second.	Mains supply voltage is less than the nominal operating voltage less 10%.	Have an accredited Cigweld Service Provider or a qualified electrician check the Mains voltage.	Weld current available. Buzzer sounds intermittently. Error code E14 automatically will reset when the voltage increases.
7 E12 error code displayed Under mains supply (input) voltage primary capacitors is reduced for one second.	Mains supply voltage is down to a dangerously low level.	A Have an accredited Cigweld Service Provider or a qualified electrician check the Mains voltage. B Have an accredited Cigweld Service Provider or a qualified electrician check the primary cable and fuses.	Weld current ceases. Buzzer sounds contstantly. Error code E12 automatically will reset when the voltage increases.
8 E81 error code displayed Wrong Primary supply (input) voltage connected.	When 3 phase machine is first turned ON with the wrong Primary supply (input) voltage connected.	Have an accredited Cigweld Service Provider or a qualified electrician check the Mains voltage.	No weld current is available. Buzzer sounds constantly. Switch machine OFF.

Table 12-1 (continued): Power Source Error Codes

9	E82 error code displayed Rated voltage selection circuit abnormality.	The Primary supply (input) voltage fluctuates and is not stable.	Have an accredited Cigweld Service Provider or a qualified electrician check the Mains voltage.	No weld current is available. Buzzer sounds constantly. Switch machine OFF then ON to reset E82 error.
10	E83 error code displayed CPU checks mains supply (input) voltage when the on/off switch on rear panel of machine is turned ON.	The Primary supply (input) voltage fluctuates and is not stable.	Have an accredited Cigweld Service Provider check connector plug on input PCB and the Mains voltage.	No weld current is available. Buzzer sounds constantly. Switch machine OFF then ON to reset E83 error.
11	E85 error code displayed Pre-charge abnormality.	Due to malfunction inside the Welding Power Source, primary capacitors are not charging correctly.	Have an accredited Cigweld Service Provider service the machine.	No weld current is available. Buzzer sounds constantly. Switch machine OFF then ON to reset E85 error.
12	E93 error code displayed Memory chip (EEPROM) on control PCB cannot read/write weld parameters.	Memory chip (EEPROM) error.	Have an accredited Cigweld Service Provider check the control PCB.	Weld current ceases. Buzzer sounds constantly. Switch machine OFF.

Table 12-1 (continued): Power Source Error Codes

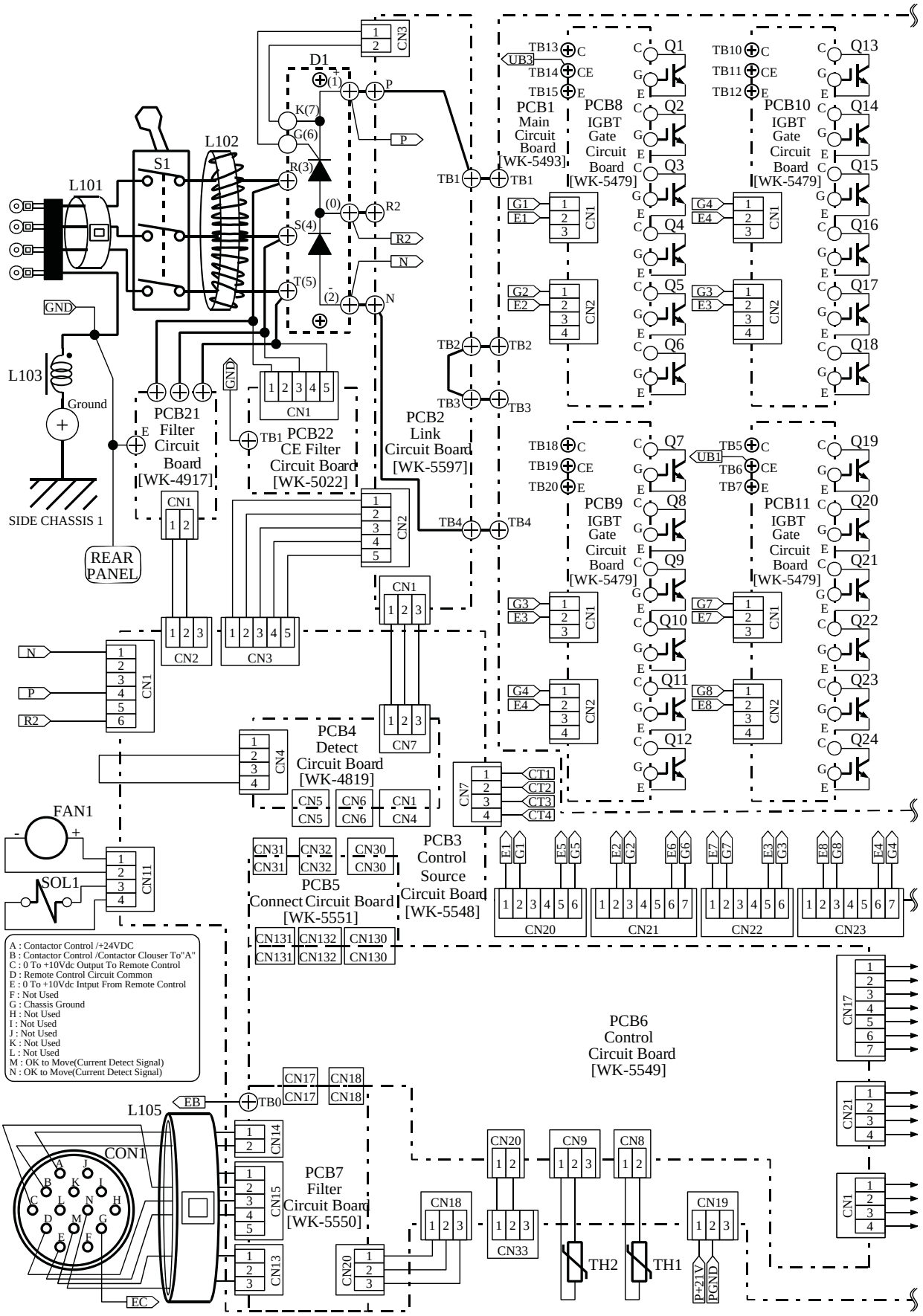
13 E94 error code displayed Temperature sensor TH1 for IGBTs or sensor TH2 for secondary diodes are open circuit.	The Welding Power Source's temperature sensors have malfunctioned.	Have an accredited Cigweld Service Provider check or replace the temperature sensors.	Weld current ceases. Buzzer sounds constantly. Switch machine OFF.
14 E99 error code displayed Mains supply (input) voltage has been turned OFF but control circuit has power from the primary capacitors.	A Main ON/OFF switch on machine has been turned OFF. B Mains supply (input) voltage has been turned OFF.	A Turn ON/OFF switch ON. B Have an accredited Cigweld Service Provider or a qualified electrician check the Mains voltage and fuses.	Weld current ceases. Buzzer sounds constantly. Must switch machine OFF then ON to reset E99 error.

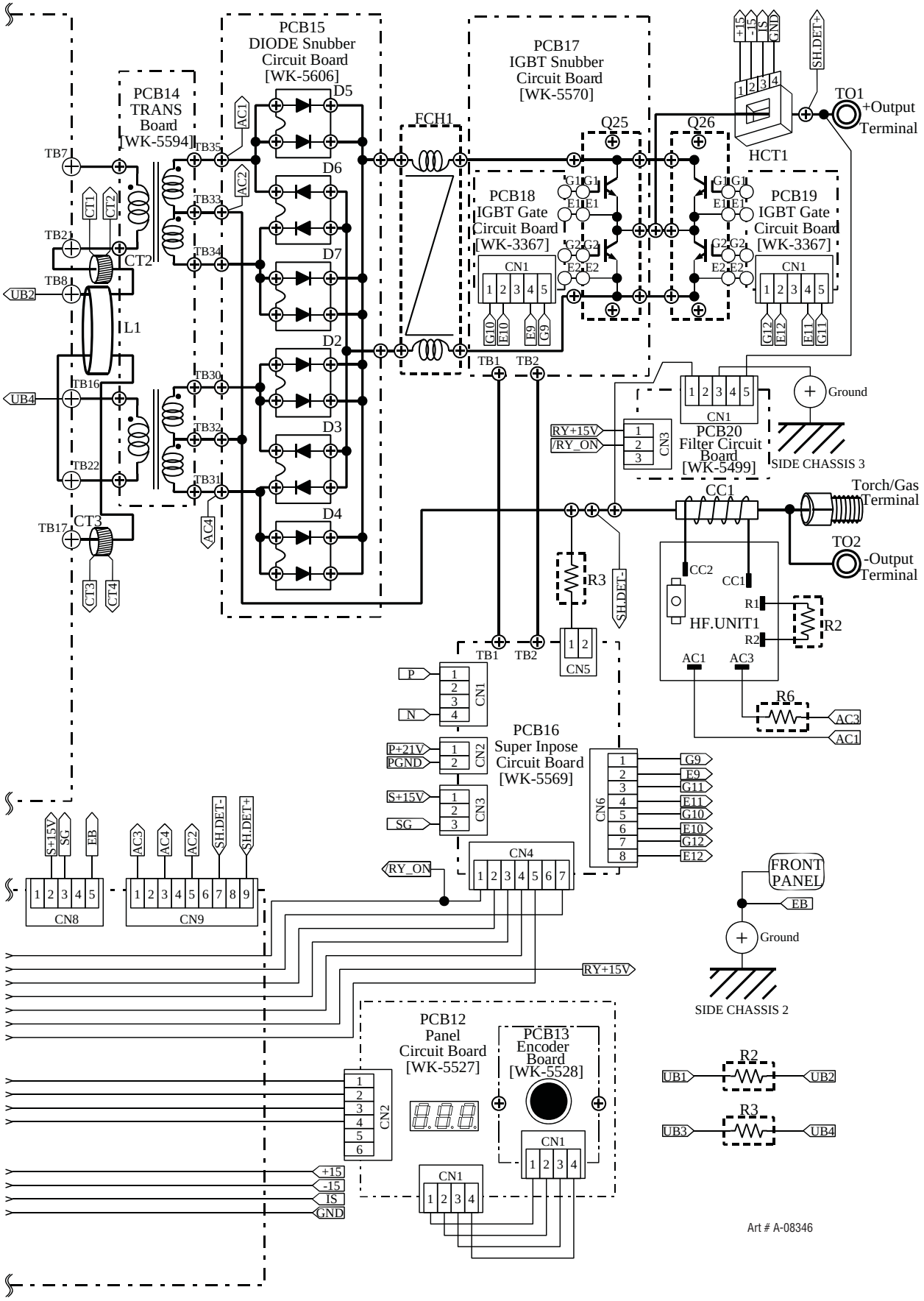
Table 12-1 (continued): Power Source Error Codes

APPENDIX 1: OPTIONS AND ACCESSORIES

Description	Part No.	Details
17 Series air cooled TIG torch (suitable for TransTig 200Pi)	518710402	TIG torch with 4 metre cable & remote current control
26 Series air cooled TIG torch	538720401	TIG torch with 4 metre cable & remote current control
200 Amp lead set, 5 metre	646323	1 x 5m work lead; 1 x 5m electrode holder
400 Amp lead set, 8 metre	646325	1 x 8m work lead; 1 x 8m electrode holder
Slide controller	OTD 10/4013	200Pi, 200AC/DC slider only
	OTD 10/2004	300Pi, 300AC/DC, 400i slider only
Hand pendant	OTD 10/4014	200Pi, 200AC/DC hand pendant only
	OTD 10/2005	300Pi, 300AC/DC, 400i hand pendant only
Foot controller	OTD 10/4016	200Pi, 200AC/DC
	OTD 10/2007	300Pi, 300AC/DC, 400i
CIGWELD COMET argon regulator	301527	Regulator only
CIGWELD COMET argon flowmeter 0-15 lpm	301710	Flowmeter only
CIGWELD COMET argon flowmeter 10-40 lpm	301711	Flowmeter only
CIGWELD COMET argon regulator/flowmeter	301526	Regulator/flowmeter only
VAF-4 Wirefeeder (for 400i ONLY)	705700	VAF-4 wirefeeder, 8m interconnection, operating manual
VS212 Voltage sensing wirefeeder	W3512006	VS212 wirefeeder, operating manual
Tweco® 4 MIG Torch	717201	MIG torch with 3.6m cable, T4 connection
ArcMaster Pro Auto-darkening Helmet, 9-13 – blue	454294	Welding helmet, 2 x spare cover lenses, product bag, operating manual
ArcMaster Pro Auto-darkening Helmet, 9-13 – blue with graphic	454295	Welding helmet, 2 x spare cover lenses, product bag, operating manual
ArcMaster Pro Auto-darkening Helmet, 9-13 – black with graphic	454296	Welding helmet, 2 x spare cover lenses, product bag, operating manual

APPENDIX 2: TRANSTIG 300 AC/DC INTERCONNECT DIAGRAM


PCB1 Main Circuit Board [WK-5493]
PCB2 Link Circuit Board [WK-5597]
PCB3 Control Source Circuit Board [WK-5548]
PCB4 Detect Circuit Board [WK-4819]
PCB5 Connect Circuit Board [WK-5551]
PCB6 Control Circuit Board [WK-5549]
PCB7 Filter Circuit Board [WK-5550]
PCB8 IGBT Gate Circuit Board [WK-5479]
PCB9 IGBT Gate Circuit Board [WK-5479]
PCB10 IGBT Gate Circuit Board [WK-5479]
PCB11 IGBT Gate Circuit Board [WK-5479]
PCB21 Filter Circuit Board [WK-4917]
PCB22 CE Filter Circuit Board [WK-5022]
REAR PANEL
SIDE CHASSIS 1
A : Contactor Control /+24VDC
B : Contactor Control /Contactor Clouser To"A"
C : 0 To +10Vdc Output To Remote Control
D : Remote Control Circuit Common
E : 0 To +10Vdc Intput From Remote Control
F : Not Used
G : Chassis Ground
H : Not Used
I : Not Used
J : Not Used
K : Not Used
L : Not Used
M : OK to Move(Current Detect Signal)
N : OK to Move(Current Detect Signal)


PCB15
DIODE Snubber
Circuit Board
[WK-5606]
PCB17
IGBT Snubber
Circuit Board
[WK-5570]
PCB14
TRANS
Board
[WK-5594]
PCB18
IGBT Gate
Circuit Board
[WK-3367]
PCB19
IGBT Gate
Circuit Board
[WK-3367]
PCB20
Filter Circuit
Board
[WK-5499]
PCB16
Super Inpose
Circuit Board
[WK-5569]
PCB12
Panel
Circuit Board
[WK-5527]
PCB13
Encoder
Board
[WK-5528]
HCT1
TO1
+Output
Terminal
TO2
-Output
Terminal
Torch/Gas
Terminal
HF.UNIT1
FCH1
L1
CT2
CT3
D5
D6
D7
D2
D3
D4
Q25
Q26
CC1
CC2
R1
R2
R3
R6
Ground
SIDE CHASSIS 3
SIDE CHASSIS 2
FRONT
PANEL
RY+15V
/RY_ON
S+15V
SG
EB
SH.DET-
SH.DET+
P+21V
PGND
P
N
RY_ON
+15
-15
IS
GND
UB1
UB2
UB3
UB4
AC1
AC2
AC3
AC4
Art # A-08346

CIGWELD LIMITED WARRANTY

LIMITED WARRANTY: CIGWELD, A Thermadyne Company, hereafter, “CIGWELD” warrants to customers of its authorized distributors hereafter “Purchaser” that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the CIGWELD products as stated below, CIGWELD shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with CIGWELD’s specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at CIGWELD’s sole option, of any components or parts of the product determined by CIGWELD to be defective.

CIGWELD MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: CIGWELD SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, SUCH AS, BUT NOT LIMITED TO, LOST PROFITS AND BUSINESS INTERRUPTION. The remedies of the Purchaser set forth herein are exclusive and the liability of CIGWELD with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by CIGWELD whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based. No employee, agent, or representative of CIGWELD is authorized to change this warranty in any way or grant any other warranty.

PURCHASER’S RIGHTS UNDER THIS WARRANTY ARE VOID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH IN CIGWELD’S SOLE JUDGEMENT MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY CIGWELD PRODUCT. PURCHASER’S RIGHTS UNDER THIS WARRANTY ARE VOID IF THE PRODUCT IS SOLD TO PURCHASER BY NON-AUTHORIZED PERSONS.

The warranty is effective for the time stated below beginning on the date that the authorized distributor delivers the products to the Purchaser. Notwithstanding the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date CIGWELD delivered the product to the authorized distributor.

Terms of Warranty – January 2008

1. The Trade Practices Act 1974 (Commonwealth) and similar State Territory legislation relating to the supply of goods and services, protects consumers' interests by ensuring that consumers are entitled in certain situations to the benefit of various conditions, warranties, guarantees, rights and remedies (including warranties as to merchantability and fitness for purpose) associated with the supply of goods and services. A consumer should seek legal advice as to the nature and extent of these protected interests. In some circumstances, the supplier of goods and services may legally stipulate that the said conditions, warranties, guarantees, rights and remedies are limited or entirely excluded. The warranties set out in Clause 2 shall be additional to any nonexcludable warranties to which the Customer may be entitled pursuant to any statute.

2. Subject to Clause 3. CIGWELD gives the following warranties to the Customer:

   Insofar as they are manufactured or imported by CIGWELD, goods will upon delivery be of merchantable quality and reasonably fit for the purpose for which they are supplied by CIGWELD.

   CIGWELD will repair or, at its option, replace those of the goods which, upon examination, are found by CIGWELD to be defective in workmanship and/or materials.

   CIGWELD reserves the right to request documented evidence of date of purchase.

3. The Warranty in Clause 2;

   Is conditional upon:

   The Customer notifying CIGWELD or our Accredited Distributor in writing of its claim within seven (7) days of becoming aware of the basis thereof, and at its own expense returning the goods which are the subject of the claim to CIGWELD or nominated Accredited Distributor/Accredited Service Provider. The goods being used in accordance with the Manufacturer's Operating Manuals, and under competent supervision.

   Does not apply to:

   Obsolete goods sold at auction, second-hand goods and prototype goods.

   Breakdown or malfunction caused by accident, misuse or normal wear and tear.

   Repairs or replacement made other than by CIGWELD or Accredited Service Providers, unless by prior arrangement with CIGWELD.

   Replacement parts or accessories which may affect product safety or performance and which are not manufactured, distributed or approved by CIGWELD.

4. CIGWELD declares that, to the extent permitted by law, it hereby limits its liability in respect of the supply of goods which are not of a kind ordinarily acquired for personal, domestic or household use or consumption to any one or more of the following (the choice of which shall be at the option of CIGWELD).

   The replacement of the goods or the supply of equivalent goods.

   The repair of goods.

   The payment of cost of replacing the goods or acquiring equivalent goods.

   The payment of the cost of having goods repaired.

5. Except as provided in Clauses 2 to 4 above, to the extent permitted by statute, CIGWELD hereby excludes all liability for any loss, damage, death or injury of any kind whatsoever occasioned to the Customer in respect of the supply of goods including direct, indirect, consequential or incidental loss, damage or injury of any kind.

Warranty Schedule – January 2008

These warranty periods relate to the warranty conditions in clause 2. All warranty periods are from date of sale from the Accredited Distributor of the equipment. Notwithstanding the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date CIGWELD delivered the product to the Accredited Distributor. Unless otherwise stated the warranty period includes parts and labour. CIGWELD reserves the right to request documented evidence of date of purchase.

CIGWELD PROFESSIONAL INVERTER WELDING EQUIPMENT	WARRANTY PERIOD	LABOR
Transtig 200 Pi, Transtig 200 ACDC, Transarc 300 Si, Transtig 300 Pi, Transtig 300 ACDC, Transmig 400 i		
Original Main Power Magnetics	3 years	2 years
Original Main Power Rectifiers, Control P.C. Boards, power switch semi-conductors	2 years	2 years
All other circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans, electric motors	1 year	1 year

Please note that the information detailed in this statement supersedes any prior published data produced by CIGWELD.

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